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CERAMBYCIDAE OF COCOS ISLAND

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Cocos Island is about 300 miles west of Costa Rica, about 350 miles north-east of the Galápagos Islands, and about 940 miles southeast of the Revilla Gigedo Islands. Like the Galápagos and Revilla Gigedos, the island is oceanic, volcanic, and isolated. Unlike them, Cocos Island has an abundant rainfall and a dense, tropical vegetation. However, of the approximately 100 species of plants recorded from the island, only about 10 per cent are regarded as endemic (Stewart, 1912; Svenson, 1935). The remainder mostly show affinity with the mainland. Except for ferns, tropical weeds, and strand plants, the flora has little in common with that of the Galápagos (Svenson, 1935) and less in common with that of the Revilla Gigedos (Johnston, 1931). (For a general summary of the biogeography of Cocos Island, see Hertlein, 1963.)

Eight species of Cerambycidae are now known from Cocos Island, although to our knowledge, only one of these has been previously reported. Apparently the first collection of material in this family was made by F. X. Williams of the California Academy of Sciences Galápagos Expedition of 1905-1906. Williams found two species, *Parandra glabra* and a subsequently named *Tacniotes (hayi)* during a brief visit to Cocos in November, 1905. However, until now his specimens have remained unstudied. Collenette (1925), who visited the island in 1924 as a member of the St. George Expedition, refers to the capture of a "longicorn beetle," but we have not seen this specimen and do not know its identity. The first species actually recorded from Cocos was captured by C. L. Hay of the Astor Expedition of 1930, and described by Mutchler (1938). P. Slud, who collected at Wafer Bay in March, 1963, brought back five species (now in the collections of the American Museum of Natural History), records for which appear below. By far the largest collection of Cocos Cerambycidae was made by G. Kuschel and R. O. Schuster on March 8, 1964, when members

of the Galápagos International Project, returning to California aboard the "Golden Bear," went ashore at Chatham Bay. This collection consisted of seven species represented by 30 specimens. Types of the new species have been deposited in the collections of the California Academy of Sciences in San Francisco.

Of the eight species presently known from Cocos, two (*Parandra glabra* and *Acanthoderes circumflexus*) range through the West Indies and Mexico into South America. The remainder are not presently known from the mainland, although their affinities are in that direction. This does not necessarily imply that they are endemic since the cerambycid fauna of Central America is still inadequately known. With the possible (but improbable) exception of *Taeniotes hayi* (see below), it can be said with confidence that the known Cocos Cerambycidae have no close affinity with those of the Galápagos or Revilla Gigedos.

Parandra glabra Degeer.

(Figures 1 and 3.)

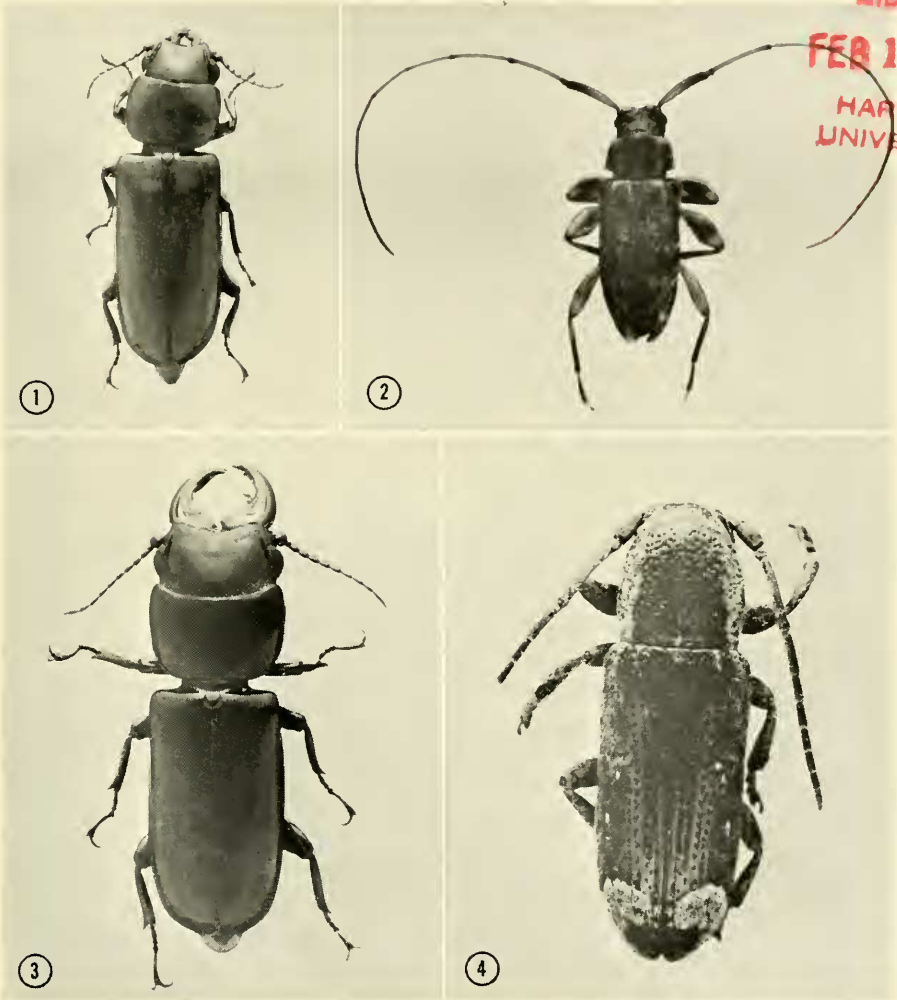
- Attelabus glaber* DEGEER, 1774, Memoires pour servir a l'histoire des insectes, vol. 4, p. 351, pl. 19, figs. 14-16.
- Parandra glabra*, GYLLENHAL, 1817, in Schönherr, Appendix and synonymia insectorum, vol. 1, no. 3, p. 145; WHITE, 1853, Catalogue of the coleopterous insects . . . British Museum, vol. 7, p. 2; THOMSON, 1860, Musée scientifique au recueil d'histoire naturelle, vol. 2, p. 78; THOMSON, 1867, Physis, vol. 1, p. 110; BATES, 1879, Biologia Centrali-Americana, Longicornia, vol. 5, p. 2; Lameere, 1902, Ann. Soc. Ent. Belgique, vol. 46, p. 76; HELLER, 1904, Stett. Ent. Zeit., vol. 65, p. 383 (larva); MELZER, 1919, Rev. Mus. Paulista, vol. 11, p. 20, pl. 1, figs. 3-4; ANDRADE, 1928, Bol. Agric., vol. 29, p. 451 (habits); LIMA, 1930, Campo, vol. 1, no. 10, p. 29 (habits); DUFFY, 1960, Monograph of the immature stages of Neotropical timber beetles, p. 44 (larva, pupa, habits).
- Gnathophorus glaber*, KIRBY, 1837, in Richardson, Fauna Boreali-Americana, p. 166.
- Scarites testaceus* FABRICIUS, 1794, Entomologia systematica, vol. 4, p. 437; FABRICIUS, 1801, Systema eleutheratorum, vol. 1, p. 123.
- Parandra ferruginea* STURM, 1826, Catalog meiner Insecten-Sammlung, Käfer, p. 78, pl. 4, fig. 33.
- Parandra mandibularis* PERTY, 1830, Delectus animalium articulorum . . ., p. 84, pl. 17, fig. 1; WHITE, 1853, Catalogue of the coleopterous insects . . . British Museum, vol. 7, p. 2; THOMSON, 1860, Musée scientifique au recueil d'histoire naturelle, vol. 2, p. 78; ROJAS, 1866, Ann. Soc. Ent. France, ser. 4, vol. 6, p. 237 (habits); THOMSON, 1867, Physis, vol. 1, p. 109.
- Parandra maxillosa* CASTELNAU, 1840, Histoire naturelle des animaux articulés, vol. 2, p. 387; THOMSON, 1867, Physis, vol. 1, p. 109.
- Parandra lineolata* GORY, 1844, in Guérin-Meneville, Iconographie du regne animal de G. Cuvier, p. 207, pl. 42, fig. 7; WHITE, 1853, Catalogue of the coleopterous insects . . . British Museum, vol. 7, p. 2; THOMSON, 1860, Musée scientifique ou recueil d'histoire naturelle, vol. 2, p. 78; THOMSON, 1867, Physis, vol. 1, p. 108.
- Parandra colombica* WHITE, 1853, Catalogue of the coleopterous insects . . . British Museum, vol. 7, p. 3; THOMSON, 1860, Musée scientifique ou recueil d'histoire naturelle, vol. 2, p. 80; ROJAS, 1866, Ann. Soc. Ent. France, ser. 4, vol. 6, p. 237 (habits); THOMSON, 1867, Physis, vol. 1, p. 110.

S-NA-S [unclear]

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FIGURES 1-4. Figure 1, *Parandra glabra* Degeer, ♀, × 1 $\frac{2}{3}$; figure 2, *Urgleptes kuscheli* Linsley and Chemsak, ♂, × 10; figure 3, *Parandra glabra*, ♂, × 1 $\frac{2}{3}$; figure 4, *Adetus nesiotis* Linsley and Chemsak, ♂, × 6 $\frac{2}{3}$.

Parandra grandis THOMSON, 1860, Musée scientifique ou recueil d'histoire naturelle, vol. 2, p. 79; THOMSON 1867, Physis, vol. 1, p. 108.

Parandra barbata THOMSON, 1860, Musée scientifique ou recueil d'histoire naturelle, vol. 2, p. 95; THOMSON, 1867, Physis, vol. 1, p. 107.

Parandra occipitalis THOMSON, 1867, Physis, vol. 1, p. 108.

Parandra obsolescens CASEY, 1912. Memoirs on the Coleoptera, vol. 3, p. 217.

This species is large, shining, and usually reddish brown in color. The punctation is obsolete over the entire surface. The mandibles of males are large and

bifid at the apices with an indication of a tooth along the dorsal inner margin a little before the middle. The females possess shorter, more angulate mandibles. Length (exclusive of mandibles), 22–30 mm.

TYPE LOCALITY. Of *P. glabra*, Cayenne?; *S. testaceus*, “Senegalia”; *P. ferruginea*, Brasil; *P. mandibularis*, Brasil; *P. maxillosa*, Brasil; *P. lineolata*, Guadaloupe; *P. colombica*, Colombia; *P. grandis*, New Granada; *P. barbata*, New Granada; *P. occipitalis*, New Granada; *P. obsolescens*, “Costa Rica (Chiriqui).”

RANGE. West Indies, Mexico to Paraguay.

FLIGHT PERIOD. September to March (Cocos Island).

HOST PLANTS. *Spondias mombin*, *Ochroma lagopus*, *Aspidosperma* sp., *Acacia decurrens*, *Araucaria brasiliensis*, *Phoebe* sp.

On Cocos Island, G. Kuschel found this species in the soft wood of balsa (*Ochroma lagopus*) and also on the bark of balsa trees, at night. The other recorded hosts are from elsewhere in its range.

MATERIAL EXAMINED. 3 ♂♂, 4 ♀♀, Chatham Bay, March 8, 1964 (G. Kuschel, R. O. Schuster); 1 ♂, Wafer Bay, March 1, 1963 (P. Slud); 6 ♂♂, 2 ♀♀, Cocos Island, November 3–13, 1905 (F. X. Williams).

Taeniotes hayi (Mutchler).

(Figure 6.)

Monochammus hayi MUTCHLER, 1938, Amer. Mus. Nov., no. 981, p. 13.

Taeniotes hayi, DILLON and DILLON, 1941, Reading Pub. Mus. Art. Gal., Sci. Publ., vol. 1, p. 17 (synonymy).

Monochammus cocoensis MUTCHLER, 1938, Amer. Mus. Nov., no. 981, p. 13.

A black, shining species with the scutellum and a spot on each side white pubescent and the elytra are vaguely, finely, white pubescent along the suture, especially at the apex. The antennae are usually elongate in the males. The antennal scape is robust and the sides of the pronotum are prominently spined. Length, 24–33 mm.

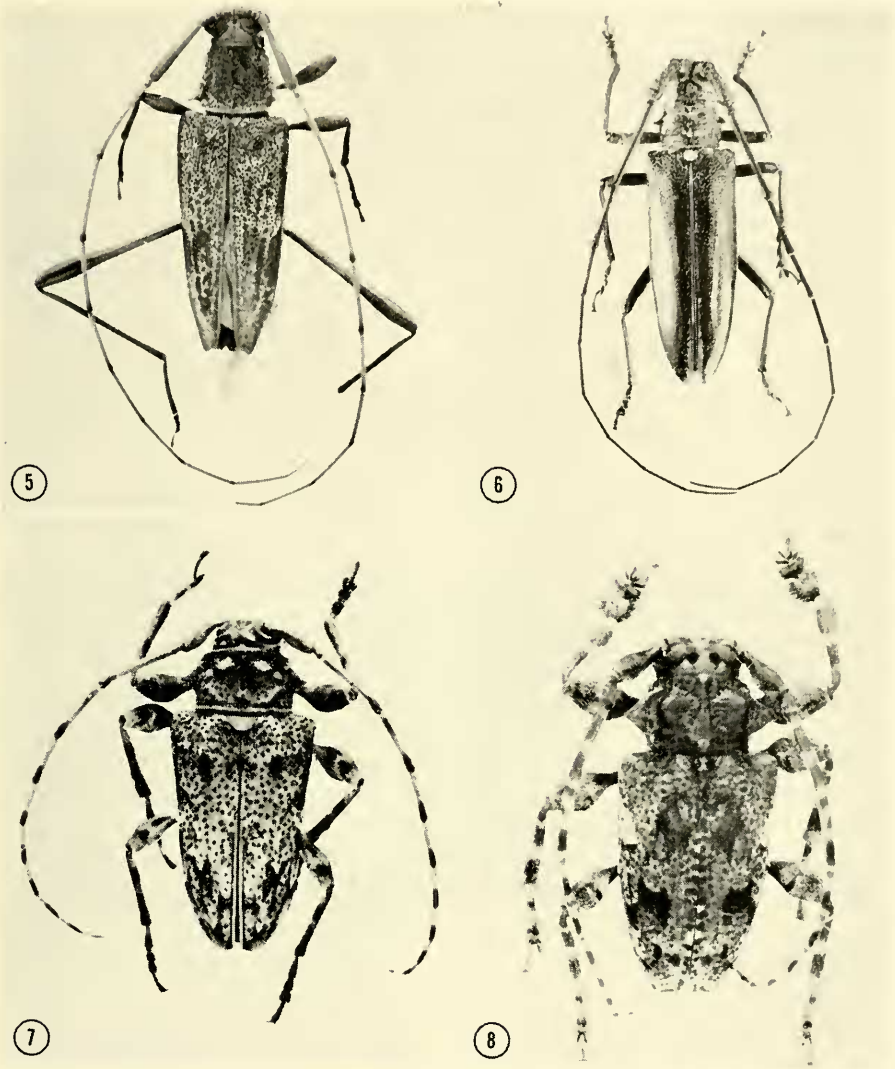
TYPE LOCALITY. Of *M. hayi*, “Indefatigable Island”; *M. cocoensis*, Cocos Island.

RANGE. Cocos Island (Galápagos record not confirmed).

FLIGHT PERIOD. March to September.

HABITS. G. Kuschel captured this species flying during the day in March.

This species was described by Mutchler from three specimens, a female designated as the holotype of *Monochamus hayi*, presumed to have been captured in the Galápagos Islands, and two males designated as holotype and “allotype” of *Monochamus cocoensis*, from Cocos Island. The differences between these two “nominal” species appear to be sexual, primarily involving the width and plication of the prosternum and the length of the antennal segments. Dillon and Dillon (1941) synonymized the two names and we agree that the synonymy



FIGURES 5-8. Figure 5, *Anisopodus longipes* Linsley and Chemsak, ♂, $\times 4$; figure 6, *Taeniotes hayi* (Mutchler), ♂, $\times 1\frac{2}{3}$; figure 7, *Acanthoderes cocoensis* Linsley and Chemsak, ♂, $\times 4$; figure 8, *Acanthoderes circumflexus* Jacquelin du Val, ♂, $\times 3\frac{1}{3}$.

is probable. Unfortunately they chose the name applied to the putative Galápagos specimen as the senior synonym. We seriously question the occurrence of this species in the Galápagos Islands.

MATERIAL EXAMINED. 2 ♂♂, Cocos Island (types of *M. cocoensis*); 4 ♂♂, Chatham Bay, March 8, 1964 (G. Kuschel, R. O. Schuster); 1 ♂, Cocos Island.

November 3-13, 1905 (F. X. Williams); 1 ♀, Indefatigable Island, Galápagos (?), April, 1930 (C. Hay) (type of *M. hayi*).

Adetus nesiotus Linsley and Chemsak, new species.

(Figure 4.)

MALE. Form moderate sized, cylindrical, subdepressed; ground color dark reddish brown, pubescence grayish ochraceous. Head short, front resting on prosternum; face oblique, broad, vertex curving back from plane area between nonprominent antennal tubercles; punctation coarse, dense; grayish ochraceous pubescence dense along sides and across front, sparser on vertex; eyes small, separated, upper lobes separated above by more than length of antennal scape; antennae extending to about middle of elytra, scape conical, less than half as long as third segment, third segment as long as fourth and fifth combined, fifth shorter than fourth, segments from fifth gradually decreasing in length, segments densely clothed with short, appressed brownish pubescence, all segments except first with numerous erect and suberect hairs beneath. Pronotum about as long as broad, broadly cylindrical, sides broadly rounded; disk very coarsely, contiguously punctate at center behind middle, punctures becoming smaller and more separated apically, basally, and laterally; each side with a densely pubescent band extending from apex to base, median area less densely pubescent, surface not obscured; prosternum fitted for reception of head; prosternal process fairly broad, expanded at apex, coxal cavities closed behind; mesosternal process abruptly declivous in front; metasternum impunctate at middle, coarsely punctate toward sides; scutellum broadly rounded behind, densely pubescent. Elytra more than twice as long as broad, cylindrical; punctures coarse, arranged in longitudinal rows on disk, more irregularly toward sides, decreasing in number toward apex; each elytron with an irregular, ill-defined longitudinal black stripe down middle and a moderately large, arcuate pubescent band near apex, each pubescent band partially enclosing a small black spot near suture; lateral pubescent band of head and pronotum extending back over humeri to about middle of elytra, other pubescence sparser, very short, not obscuring surface; apices rather narrowly rounded. Legs short, densely brown, and pale pubescent. Abdomen densely pubescent, coarsely punctate at sides; apex of last sternite very shallowly emarginate. Length, 11 mm.

HOLOTYPE ♂ from Cocos Island, March 8, 1964 (R. O. Schuster).

Acanthoderes circumflexus Jacquelin du Val.

(Figure 8.)

Acanthoderes circumflexus JACQUELIN DU VAL, 1857, in: Sagra, Histoire . . . de l'île de Cuba, vol. 7, p. 270; CHEVROLET, 1862, Ann. Soc. Ent. France, ser. 4, vol. 2, p. 247; BATES, 1872, Trans. Ent. Soc. London, vol. 1872, p. 207; BATES, 1880, Biologia Centrali-Americana, Longicornia, vol. 5, p. 140; GAHAN, 1895, Trans. Ent. Soc. London, vol. 1895, p. 130.

Acanthoderes quadrigibba, (*pars*), DUFFY, 1960, Monograph of the immature stages of Neotropical timber beetles, p. 214 (larva, habits).

Moderate sized, ground color dark reddish brown. The pubescent pattern of the elytra consists of two white arcuate bands extending from the lateral margins a little behind the humeri to about the center of the disk, two irregular black patches behind the middle with pale brown, black, and white pubescence suffused in patches throughout. The antennae and tibiae are annulated and the apices of the elytra emarginate truncate with the outer angles subdentate. Length, 13–16 mm.

TYPE LOCALITY. Cuba.

RANGE. West Indies, Mexico to northern South America.

FLIGHT PERIOD. March and April (Cocos Island).

Specimens were collected at light and on bark of trees at night by G. Kuschel.

MATERIAL EXAMINED. 2 ♂♂, Chatham Bay, March 8, 1964 (G. Kuschel); 1 ♂, 3 ♀♀, Wafer Bay, March 1, 1963 (P. Slud).

Acanthoderes cocoensis Linsley and Chemsak, new species.

(Figure 7.)

MALE. Form robust, moderate sized, convex above; ground color dark reddish brown, densely clothed with grayish yellow appressed pubescence interrupted by coarse separated punctures. Head with front flat, subquadrate, with a small shallow diamond-like impression between antennal tubercles; antennal tubercles well developed, strongly divergent; punctuation minute, obscured by short appressed brownish and yellowish pubescence; frontoclypeal suture with four long erect setae, frontal suture deep; eyes small, rather finely faceted, deeply emarginate, separated above by about diameter of antennal scape; antennae extending about four segments beyond body, segments uniformly clothed with minute yellowish pubescence except base and apex of third and fourth segments and apices of remaining segments which are brownish, the dark bands increasing in length apically, underside of segments with long suberect setae which diminish in number apically; scape extending to about apical one-fourth of pronotum, subequal in length to fifth segment, fourth longer than fifth, third longer than fourth, eleventh slender, shorter than tenth. Pronotum about twice as long as broad, base broader than apex; sides slightly rounded to basal margin, not constricted basally, sides strongly inflated to produce a broad almost obtuse tubercle; disk convex, with three prominent calluses, one median near basal margin and one on each side of middle at apical one-third, punctures coarse, sparse, scattered around dorsal calluses and in a row along basal and apical margins but not extending to sternum; pubescence uniform, dense, recumbent, yellowish and brown with median callus a little glabrous; prosternum narrow, impunctate, intercoxal process broad, expanded apically, coxal cavities closed, pubescence dense, recumbent, yellowish at sides; mesosternal process very broad, episternum of metathorax narrow, pubescence at middle of sternites finer,

sparser, and brown; scutellum broadly rounded behind, finely densely pubescent. Elytra over $1\frac{1}{2}$ times as long as broad, tapering apically; humeri well developed; surface convex, even, costae vague, disk with elevated, densely pubescent tubercle on each side at middle on basal one-fourth; punctures coarse, separated, becoming very sparse toward apex; pubescence brownish yellow, dense, recumbent, interrupted by patches of brown pubescence laterally behind humeri and on disk on apical one-half; apices slightly obliquely truncate. Legs with femora strongly clavate, finely clothed with pale recumbent pubescence; tibiae dark brown with small rings of paler pubescence at base and middle. Abdomen densely pubescent along sides, less densely at middle, punctures obsolete; apex of last sternite rotundate-truncate. Length, 10–12 mm.

HOLOTYPE ♂ from Cocos Island, March 8, 1964 (R. O. Schuster); one ♂ paratype from Wafer Bay, Cocos Island, March 1, 1963 (P. Slud).

This species appears to be assignable to the genus *Acanthoderes* in the broad sense. It is distinctive in its small size and untufted front tarsi.

Acanthoderes species.

A broken specimen of what may prove to be an undescribed species of *Acanthoderes* (*sensu lato*) may be briefly characterized as follows: Form large, robust; ground color reddish, pubescence grayish; elytral costae distinct, each elytron with an irregular oblique median dark fascia and a smaller broken apical band; elytral apices truncate.

MATERIAL EXAMINED. A female from Wafer Bay, Cocos Island, March 1, 1963 (P. Slud).

Anisopodus longipes Linsley and Chemsak, new species.

(Figure 5.)

MALE. Form moderately large, body flattened; ground color dark reddish brown, pubescence ochraceous. Head small, front short, quadrate, vertex extending back at right angle from front, antennal tubercles prominent, diverging at right angles from contiguous bases, median line slender, not deeply impressed; genae short with a small obtuse tubercle at apex; pubescence fine, appressed, dense but not concealing surface, punctation minute; eyes large, rather finely faceted, deeply emarginate, lower lobes large, upper lobes separated by about diameter of antennal scape; antennae slender, extending about five segments beyond body, segments three to six paler with dark apices, segments densely clothed with short recumbent pubescence, scape with a few longer suberect hairs beneath, scape subequal in length to third segment, third subequal to fourth, fourth slightly longer than fifth, eleventh slender, subequal to tenth. Pronotum broader across lateral tubercles than long, apex narrower than base, sides diverging from apex to tubercles near base than constricted behind tubercles, lateral tubercles acute, slightly directed backwards; disk flattened, with a slender, elongate glabrous median callus extending from a little before basal

margin to a little beyond middle, each side with a vague oblique callus on apical one-half; punctures rather fine, arranged around glabrous raised areas; pubescence fine, very short, appressed, dense along sides, sparser toward center; prosternum narrow, apically impressed, minutely punctate, finely, densely pubescent; prosternal process flat, expanded apically, coxal cavities closed; episternum of metathorax slender, densely pubescent; scutellum broadly rounded behind, densely pubescent except for median apical spot. Elytra over twice as long as broad, tapering apically; punctures over basal one-half coarse, dense, becoming sparser toward apex; very short recumbent pubescence variegated with darker hairs, each side with a large patch of yellowish pubescence below and behind humeri, each elytron with an indistinct dark angulate postmedian band; apices narrow, emarginate, angles not produced. Legs with hind femora elongate, extending well beyond body, gradually clavate toward apices; front and middle femora clavate, short; hind tibiae elongate, straight, other tibiae shorter and somewhat arcuate; hind tarsi with first segment very elongate, slender; pubescence fine, pale, tibiae dark at apex. Abdomen minutely punctate, finely pubescent; apex of last tergite deeply notched, apex of last sternite shallowly emarginate. Length, 11–14 mm.

FEMALE. Legs with hind femora and tibiae not elongate, femora not extending beyond body. Abdomen with apex of last tergite emarginate, apex of last sternite shallowly emarginate. Length, 9–12 mm.

HOLOTYPE ♂, allotype ♀ from Cocos Island, March 8, 1964 (R. O. Schuster); 13 paratypes (8 ♂♂, 5 ♀♀) all from Cocos Island, March 8, 1964 (R. O. Schuster, G. Kuschel), March 1, 1963 (P. Slud), April 16, 1963 (P. Slud).

Anisopodus longipes appears to be closely related to the mainland species *A. xylinus* Bates. The gradual thickening of the elongate hind femora, a character shared by both species, is not common in the genus. *Anisopodus longipes* differs from *A. xylinus* by having darker coloration, by the possession of a postmedian dark elytral band, and by the very prominent yellowish patch of pubescence below and behind the humeri.

***Urgleptes kuscheli* Linsley and Chemsak, new species.**

(Figure 2.)

MALE. Color pale brown, elytra and pronotum variegated with patches of dark brown, antennae mostly pale, legs testaceous with dark patches on femora, tibiae dark apically, underside pale brownish. Head small, darker brown, front quadrate, convex; antennal tubercles elevated, widely divergent; eyes small, deeply emarginate, coarsely faceted, separated above by at least twice diameter of antennal scape; punctation minute, finely scabrous; pubescence fine, appressed, golden, front with two very long erect setae along margin of each eye and four more along frontoclypeal margin; antennae slender, extending more than five segments beyond body, segments pale, scape darkened over apical

one-half, segments to fifth narrowly darkened at apex, remaining segments slightly darker, scape subequal in length to third and fourth segments, fifth shorter than fourth, sixth to eleventh subequal, shorter than fifth, segments to fourth with several suberect hairs beneath. Pronotum broader than long, sides broadly rounded to acute tubercles near base, then strongly constricted behind tubercles, lateral tubercles directed backward, base shallowly, transversely impressed, apex not impressed; disk convex, surface finely asperate punctate, with a vague median callus near base; pubescence fine, pale, appressed, not obscuring surface; each side of middle with a broad dark brown band extending down sides over lateral tubercles; prosternum narrow, subglabrous, prosternal process lamini-form, expanded behind, coxal cavities closed, coxae contiguous; mesosternal process very narrow, punctuation of metasternum minute, shallow, vague, pubescence fine, appressed; scutellum rounded behind, sparsely pubescent. Elytra over twice as long as broad, sides subparallel to apical one-third then tapering; dark brown splotches and stripes scattered over surface, over humeri and laterally to apex, near suture behind scutellum and down disk either as narrow lines or as larger spots behind middle; pubescence on paler areas white, subappressed, coarser and longer than dark hairs on dark areas; punctuation over basal half coarse, subcontiguous, becoming finer and sparser apically; apices narrowly, slightly obliquely subtruncate. Legs short, front and middle femora strongly clavate, hind femora feebly clavate, tarsi and apical half of tibiae dark brown, femora with a dark band over portion of club. Abdomen finely pubescent; fourth sternite subequal in length to fifth, fifth sternite subtruncate at apex. Length, 3.5 mm.

FEMALE. Fifth abdominal sternite broader than fourth, apex rounded. Length, 3.5 mm.

HOLOTYPE ♂, allotype ♀ from Cocos Island, March 8, 1964, collected on small branches of balsa (*Ochroma lagopus*) (G. Kuschel); one ♂ paratype, same data.

Some variation in the dark elytral coloration is evident in the type series. The types both possess a postmedian brown splotch almost resembling an interrupted fascia. Behind this the apex is dominantly dark with pale irregular variegations. The other male has three irregular, longitudinal, dark stripes over most of the elytral surface.

We take pleasure in naming this species in honor of G. Kuschel who collected much of the material used in this study.

ACKNOWLEDGMENTS

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Material collected at the same time by R. O. Schuster was kindly made available by Hugh B. Leech, California Academy of Sciences, San Francisco. Dr. Jerome G. Rozen of the American Museum of Natural History loaned material collected by P. Slud, and E. F. Gilmour sent a copy of his manuscript key to the species of *Anisopodus* which enabled us to confirm our belief that the Cocos Island species was undescribed. To all of the above we extend our thanks.

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